Mitral subannular left ventricular aneurysm

A case report

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Summary

A mitral subannular left ventricular aneurysm in an Ovambo man is described. This condition should be suspected in patients of negroid descent presenting with mitral incompetence and a localised bulge on the left heart border on chest radiography. Mitral and aortic subannular aneurysms are discussed, including the diagnostic use of ECG gated cardiac blood pool imaging.

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Case report

A 34-year-old Ovambo man was initially treated for malaria in a peripheral hospital. A chest radiograph showed a possible mediastinal mass and an exploratory thoracotomy in Windhoek revealed a large pulsatile mass at the left heart border. The patient was then referred to Tygerberg Hospital for further investigation.

He complained only of occasional fleeting stabbing left-sided chest pains unrelated to exercise. There was no dyspnoea or palpitations.

On clinical examination, the only abnormalities found were in the cardiovascular system. The pulse rate was 88/min, at times irregular, and all peripheral pulses were present. The blood pressure was 120/80 mmHg and the jugular venous pressure normal. There was a systolic pulsation in the fourth left intercostal space parasternally and a grade 2/6 midsystolic murmur in the mitral area.

Serological tests for syphilis were negative. A chest radiograph showed a mass in the region of the left superior heart border (Fig. 1). ECG showed a supraventricular rhythm with nodal and ventricular ectopic beats (Fig. 2). A 24-hour Holter ECG showed a short episode of supraventricular tachycardia of 120/min. Computed tomography of the mediastinum showed a 5 x 7,7 cm mass on the left cardiac border, extending from the pulmonary window to above the left ventricle.

An area of calcification was noted in the periphery of the mass. ECG gated blood pool imaging with technetium-99m red blood cells, which also included a first-pass study, showed the mass to be partially blood filled, expanding during systole and communicating with the left ventricle. A large avascular area was noted within the mass. The left ventricular ejection fraction was 62% (Fig. 3). Cardiac catheterisation confirmed the diagnosis of a subannular left ventricular aneurysm in relation to the posterior cusp of the mitral valve (Fig. 4).

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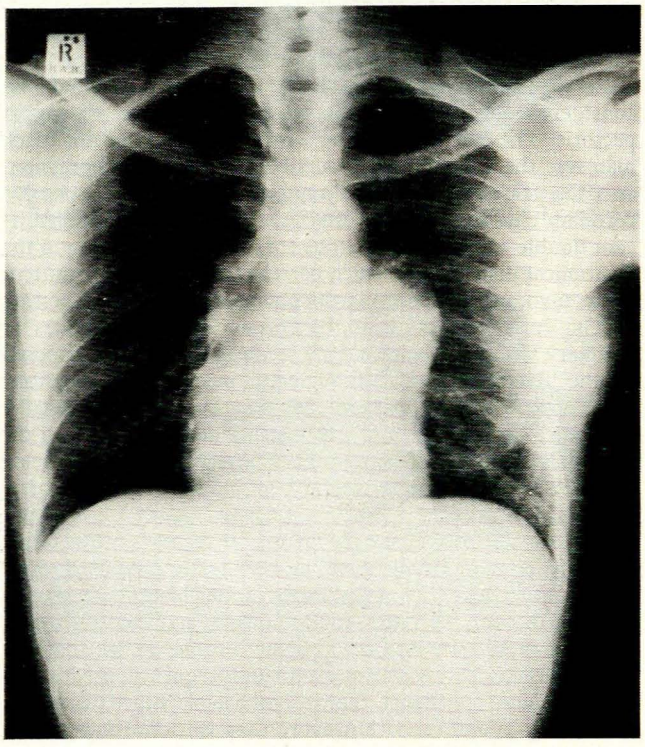

Fig. 1. Chest radiograph showing aneurysm in the region of the left superior heart border.

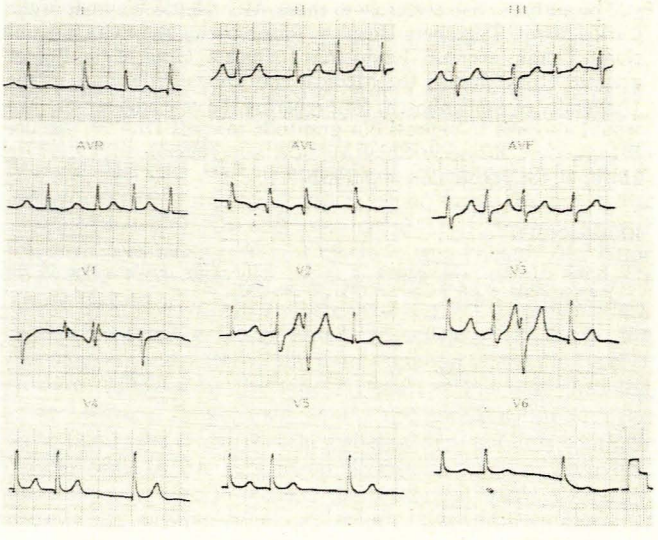

Fig. 2. Resting 12-lead ECG (full standardisation) showing a supraventricular rhythm with nodal and ventricular ectopic beats.

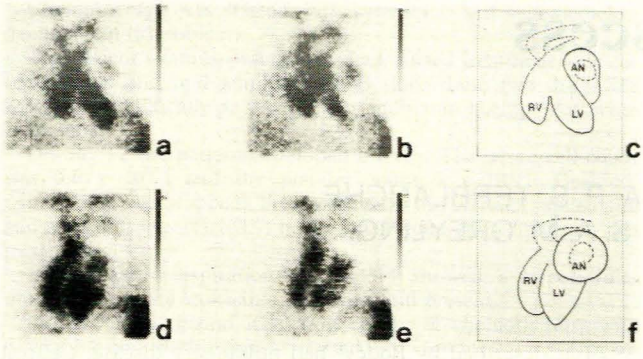

Fig. 3. Gated blood pool images in the anterior (a = diastole; b = systole; c = key) and left anterior oblique views (d = diastole; e = systole; f = key) show large partially blood-filled aneurysm (RV = right ventricle; LV = left ventricle; AN = aneurysm).

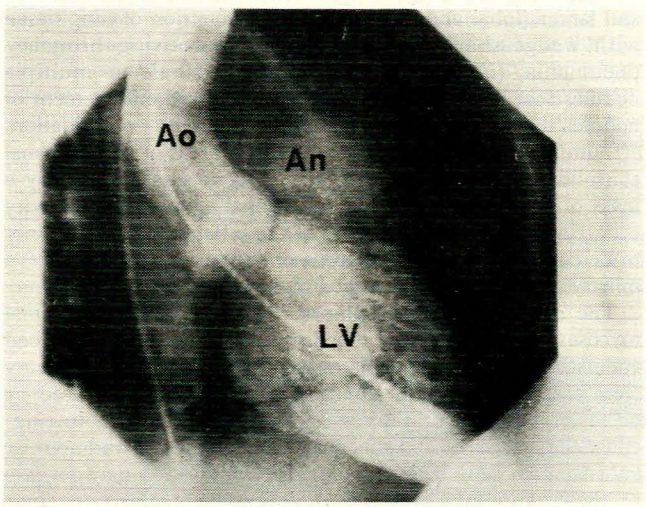

Fig. 4. Left ventricular cine angiogram in right anterior oblique projection (Ao = aorta; LV = left ventricle; An = aneurysm).

Discussion

Left ventricular aneurysms of the annular subvalvular type were described in the literature before 1962,[1-3] when Abrahams[4] introduced the term 'annular subvalvular left ventricular aneurysm' for this unusual type arising in the fibrous rings below either the mitral or aortic valves. These aneurysms are peculiar to the negroid races, are of unknown aetiology and are unrelated to syphilis or atherosclerosis. Today they are probably the most common cause of left ventricular aneurysms in blacks, but the true incidence is unknown.[5]

Two types have been described: submitral and sub-aortic, the former being the more common. The orifices, single or multiple, are situated in the left ventricle immediately below the valve cusps. These aneurysms may contain calcified clot, as in our patient.[6,7]

The submitral type may present with a systolic pulsation in the third or fourth left intercostal space, a mitral incompetence murmur that is not always pansystolic, or even a continuous murmur.[8] In the sub-aortic type, aortic incompetence may be the only sign, as the aneurysm itself does not distort the cardiac contour on chest radiography. A ruptured sub-aortic aneurysm in the absence of a murmur has been described by Rose *et al.*[9]

The ECG is abnormal in most cases. There may be non-specific ST-segment and T-wave changes, left ventricular hypertrophy out of proportion to the degree of incompetence, supraventricular arrhythmias (as in our patient), or myocardial ischaemia or infarction. A case presenting with ventricular tachycardia has been described.[10]

Chest radiography may suggest the diagnosis of the submitral type. Characteristically, there is a bulge on the left cardiac border, the size and shape depending on the size and position of the aneurysm. On fluoroscopy it can be seen to pulsate. Two-dimensional echocardiography has been used for the detection and assessment of the submitral type.[11] In our case gated blood pool imaging proved to be a very useful non-invasive diagnostic technique. Onik *et al.*[12] described the radionuclide study findings in false left ventricular aneurysms, including 5 congenital and 7 aneurysms of unknown aetiology, and found first-pass scintigraphic study to be a primary diagnostic procedure, allowing differentiation of false from true left ventricular aneurysms. In the false variety the left ventricle is visualised first; in the true left ventricular aneurysm they appear together. To our knowledge, the specific diagnosis of a mitral subannular aneurysm by gated blood pool imaging has not been described previously. Cardiac catheterisation helps to confirm the diagnosis, locate the origin of the aneurysm, and assess the severity of the haemodynamic disturbance.[13]

Complications include myocardial ischaemia and infarction due to compression of the circumflex artery, systemic embolisation, congestive cardiac failure and infective endocarditis.[14]

Surgical resection of the aneurysm with or without valve replacement offers the only chance of cure.[5] It is indicated in severe valvular regurgitation or cardiac failure resistant to medical therapy.[6]

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